OFFICE OF AUDITS
MEMORANDUM REPORT 98-IM-009
SOFTWARE DEVELOPMENT
AT OVERSEAS POSTS
APRIL 1998

The Office of Inspector General (OIG) has completed a review of software development[1] at the Department of State's and the United States Information Agency's overseas posts. Our objectives were to determine how well the Department of State's bureaus and posts manage and control software development overseas and how these locally developed software applications meet posts' needs. We concurrently reviewed how the United States Information Agency (USIA), known as the United States Information Service (USIS) overseas, manages its overseas software development activities.

Despite heavy reliance on computers and software in about 270 overseas posts, the State Department has not established policies, issued guidance, or mandated procedures for how posts develop and acquire local software applications. Further, post personnel have been developing computer applications without proper oversight and, as a result, they have not met Federal software development and reporting standards. Post personnel are duplicating each others' software development efforts and initiating local contracts for the development of new applications with mixed success. Without Department intervention, posts will likely continue uncoordinated software development activities as they attempt to meet their growing automation needs. The Department has not been able to quantify either the extent or the cost of posts' software development activities, however, both appear to be substantial. In addition, nearly all posts are faced with the need to convert obsolete software applications they can no longer use, and as posts acquire easier to use development software and modernize their computer hardware with local area networks (LANs), the amount of local software development may increase. A few geographic bureaus have begun sponsoring collaboration among their constituent posts to promulgate locally developed software that may be applicable to many posts.

Conversely, USIA's overseas staffs generally do not develop local software applications, but rely on corporate applications that are developed centrally or initiated at posts and then are sponsored by USIA headquarters. Post initiated applications are usually completed and documented by headquarters' technical staff members. USIS overseas staffs, however, told us that they have not been fully satisfied with the corporate software they have received.

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1. This report distinguishes between locally developed software applications that are developed at overseas posts to satisfy overseas users needs and corporate applications that are developed and disseminated by headquarters' bureaus and offices for worldwide use. Bureaus and offices support and maintain corporate applications; overseas posts support and maintain their locally developed software applications.

We are recommending that the Department's chief information officer, in coordination with the deputy chief information officer for Information Resource Management Operations and geographic bureaus' executive officers, establish policies and appropriate guidance for developing and managing overseas software application development, identify post requirements that should be addressed by corporate applications, and develop a strategy to meet those requirements. We are also recommending that mechanisms be created for posts to more effectively share locally developed applications, report significant software development expenditures, and follow specific procurement guidelines before contracting for custom-developed applications.

We received formal written comments to a draft version of this report from the Department's chief information officer, the Bureau of Finance and Management Policy (FMP), and the Bureau of Administration's Office of Information Management (A/IM)[2] and Office of the Procurement Executive. These comments appear in their entirety as appendices B, C, D, and E, respectively. The chief information officer agreed with the report in its entirety and did not suggest any changes. The Bureau of Finance and Management Policy concurred with our recommendation that costs associated with posts' expenditures for local software procurement and development are important to track and report, and has established budget object codes to track these costs. However, FMP did not agree that it is that bureau's responsibility to track the software development expenditures of individual posts. The Office of Information Management agreed with two of the three recommendations the OIG made to that office. A/IM did not agree with Recommendation 3 as it believed the recommendation would place life cycle responsibilities for locally developed applications on A/IM rather than with the corporate entities that own the business processes. The intent of the recommendation was to have posts list and describe their applications and we have clarified the report language to respond to A/IM's concerns. The Office of the Procurement Executive also suggested changes to the draft report to clarify Federal requirements for contracts over $2,500. We made the suggested changes. The Executive Office of the Bureau of European and Canadian Affairs and representatives of USIA's Office of Technology provided informal comments to the draft report and agreed with the facts as they were represented. We have incorporated the suggestions that were made, as appropriate, throughout the report.

PURPOSE AND SCOPE

To determine how well the Department of State and USIA manage and control software development overseas and how locally developed software meets posts' needs, we interviewed both systems development and users' staffs at the Department's geographic and functional bureaus and in domestic offices. We interviewed the chief information officer and key officials in the Bureau of Administration's Office of Information Management (A/IM) on several occasions throughout the audit. We also reviewed technical activities in USIA's functional bureaus, including appropriate offices and division staffs within the Bureau of Management's Office of Technology.

[2] As this report was being prepared, A/IM was officially being renamed and reorganized under the chief information officer. The new office will be called Office of Information Resource Management. Recommendations made in this report reflect the new office designations.

We visited five embassies that had active software development programs and four co-located USIS offices. At each location, we obtained inventories of locally developed software applications and reviewed how post-sponsored software applications operated. We assessed whether the software developed there had improved mission performance, increased productivity, or reduced costs. We also determined if similar applications had been developed at the other posts we visited. We visited Vienna, Austria; Rome, Italy; New Delhi, India; Bangkok, Thailand; and Seoul, Korea. In Bangkok, we also interviewed officials from the Regional Information Management Center and the Financial Service Center. In Vienna, we also visited and reviewed the operations of one of USIS's three regional program offices. We selected these locations based on suggestions from the Department's geographic bureaus and USIA's technical managers who were generally familiar with the posts' software development activities.

We also reviewed all posts' responses to a Departmentwide inquiry sponsored by A/IM, in late 1995 regarding the incidence of local software development and we met with officials to discuss A/IM's involvement in coordinating such development. We attended a software conference the Bureau of European and Canadian Affairs sponsored and commented on and agreed to its proposal to sponsor a pilot program to coordinate, control, and distribute locally developed software applications.

We conducted our review in accordance with generally accepted government auditing standards and included such tests and auditing procedures as were considered necessary under the circumstances. The Information Management Division performed the work from August 1996 to July 1997. Major contributors to this report were Andrea M. Leopold, division director; Gregory Linden, audit manager; Lester Krings, auditor-in-charge; and John Shiffer, auditor.

BACKGROUND

Responsibility for the Department's information resource management (IRM) is diffused among bureaus, offices, and overseas posts. These organizations manage their share of the Department's more than $400 million IRM budget with relative autonomy. The organizations spend a portion of their IRM budgets for salaries of technical staff that coordinate and support post information technology programs, including the development, procurement, and maintenance of locally developed and corporate software.

Responsibility for USIA's information resource management is centralized in the Bureau of Management's Office of Technology, which controls USIA's $55 million IRM budget. The Office of Technology is also responsible for developing and distributing the corporate software used agencywide. The Office of Technology's Overseas Support Branch coordinates and approves locally developed corporate applications. The Computer Management Division and the Communications Division provide computer and telecommunications support to overseas posts.

USIA's corporate software applications developed to meet posts' needs include the Distribution Record System (DRS), the Budget Reporting Overseas Management System (BROMS), and the Country Plan Application. The DRS assists in distributing USIA's publications and other materials to local audiences, selecting guests to invite to posts' functions,

and determining how to reach targeted audiences within selected areas. The BROMS is used to establish posts' budgets and to track expenditures. The Country Plan Application helps USIS posts indicate how thematic objectives, derived from broad programmatic issues, will be accomplished; it also predicts resource requirements and indicates whether the objectives were met.

The Clinger-Cohen Act of 1996 required that major Federal departments and agencies appoint a Chief Information Officer (CIO) to manage and evaluate information technology investments. The Department's CIO advises the Secretary regarding the use of information technology resources and is responsible for establishing information policy. Because the CIO is responsible for the Department's information policy, some recommendations in this report are directed to the CIO. M/IRM (previously A/IM) provides the Department's technical infrastructure and assists in systems development and implementation, coordinating hardware, software, and information resources for the Department. An Information Technology Consolidation team is currently analyzing how USIA's information technology activities will be merged with the Department's when consolidation is completed. We expect the consolidation of foreign affairs agencies to result in a single CIO who will oversee all information and technology resources.

DEPARTMENT OF STATE SOFTWARE DEVELOPMENT PRACTICES

The Department has not established policies, issued guidance, or mandated procedures that overseas posts should follow when developing software. As a result, some post-developed software duplicated other posts' efforts, and no software development project closely adhered to a detailed management plan that assured the application could perform the specific capabilities users required. Consequently, most of the software we reviewed did not meet user needs. Post-developed software was not adequately documented, used non-standard data terminology, and had not been properly tested. Further, post management often did not provide adequate oversight or account for software development costs as required by the Office of Management and Budget. We also found that when posts purchased commercially available software or contracted with local software development vendors they frequently did so without first performing a thorough requirements analysis. Many of these procurements cost more than post management had budgeted and still failed to meet user needs.

Duplicated Development Efforts

Some software developed by Foreign Service national and contract employees duplicated other posts' efforts, was costly, and was seldom shared with other posts. For example, we found that although overseas posts often have similar needs, their technical staffs develop software applications specifically to meet local requirements. Local software developers are often unaware of other posts' application development activities and rarely share the software they have developed. Consequently, posts' software applications frequently duplicate software applications that have already been developed or are under development at other posts.

At every post we visited, software applications were developed locally and used to automate routine and time-consuming embassy operations. The following table portrays the number of software applications we identified at the five posts we visited and the number of applications at each post that duplicated applications found at other posts. We found that 29 software applications had been developed that duplicated those found at other posts. The table below shows the number of locally developed software applications and operating platforms, at each post visited.

Table I

Locally Developed Software Applications at Five Posts Visited

Post Visited	PC-LAN Applications	VS Wang Applications	Total Applications at each post visited	Number of Duplicate Applications*
Post A	9	10	19	9
Post B	5	11	16	8
Post C	5	14	19	7
Post D	2	8	10	3
Post E	4	3	7	2

* This column shows the number of applications at each post that duplicated applications at other posts.

Some of the most common locally developed software applications are described briefly below:

Diplomatic Contacts

Every post used software to manage its diplomatic contacts for official embassy events. The applications display and manipulate data about guests for representational purposes. Four of the five posts met this need, with varying degrees of success, by developing a local application. These applications array personal contact data in a specific format the user requested. The database of names and information can be searched based on pre-determined criteria, such as education level and career category. The applications were built using Windows™-based database programs that permit users to view the data in many different ways. These applications were readily available to employees using the embassy's LAN and had become integral to the ambassador's diplomatic management system.

Personnel Applications

Two of the five posts had developed their own local personnel database applications to replace the Department-supplied software intended for the same purpose. These applications were the most complex that we observed at overseas posts as they provided post managers a greater degree of flexibility in retrieving information related to both American and Foreign Service national personnel employed at post. For example, the Windows™-based applications allowed a wide range of personnel data to be retrieved by many variations of name and specific office or position, telephone number, and employee identification numbers. These applications met a wide range of posts' management needs. They allowed the personnel office to make salary and training decisions, assisted the security office to verify and update clearances, and helped the general service office assign office space and housing. Data searches could match employees' names with Social Security number, current address, permanent address, security clearance level, dates of arrival and departure, family member information, passport data, telephone numbers, agency affiliation, office number, current grade and salary, and travel and training information. The information was being used to process routine administrative forms and has, reportedly, streamlined embassy operations where the applications are working. According to staffs, these applications are extremely helpful, particularly in an emergency when family member and passport information are needed quickly.

The Continuing Demand for Local Development

Because the Department is modernizing its automatic data processing equipment in all domestic bureaus and at overseas posts, information technology staffs are continuing to develop and modify local software applications. Posts in every geographic region are now replacing obsolete, proprietary systems and locally developed software applications that they, or previous staffs, have depended on. The Office of Information Management (A/IM) has encouraged bureaus and offices to purchase new computer equipment that is not dependent on a single vendor and is compatible with the Department's overall modernization strategy. In response, many bureaus, offices, and overseas posts are installing LANs and automated systems that use open systems technology. The modern equipment and software have made software development easier than it was in the past. Consequently, posts' staffs, both Foreign Service officers and Foreign Service nationals, have been converting proprietary applications to operate in the new computing environment and developing more local applications to meet posts' needs. In addition, recent regional and global initiatives, such as the Department's International Cooperative Administrative Support Services (ICASS) program, which emphasizes local empowerment and decision-making, create new requirements for computer-generated calculations and electronic "cuff records." Information technology staffs in dozens of embassies are already developing software they intend to use as a complement to ICASS to track how costs are accumulated and how these costs are redistributed to participating agencies.

Standards Not Used In Developing Local Software

Posts' software development activities generally did not follow a standard methodology, such as a disciplined and well-planned life cycle management approach. Using an identifiable and

consistent management approach is required of all Federal agencies that develop software and is intended to result in well-documented, thoroughly conceived, and adequately tested applications. The locally developed applications we observed exhibited both technical deficiencies and operational problems that caused the applications to be less useful.

Federal information processing standards, such as those outlined in the Federal Information Processing Standard (FIPS) numbers 38, 64, and 106, provide clear instruction and suggest that software developers follow a disciplined life cycle management approach for their development projects. Federal software developers are to define application requirements early, plan for the needed resources, and thoroughly test the new software. Unless these guidelines are followed, locally developed software applications are likely to be deficient.

While locally developed software has the potential to provide tangible benefits to post users, and many applications routinely do, most of the software we observed was undocumented, not developed in coordination with posts' other locally developed applications, and was problem prone. For example, none of the applications we saw were adequately documented. As a result, the application logic was known only to the software developer, and to a limited extent, to the users who provided input during application development. These applications could not be shared -- even though they might have fulfilled needs of other posts. Also, without proper documentation, it is extremely difficult to troubleshoot technical problems that routinely occur in new software. This creates an unnecessary risk to the Department's and posts' computer operations.

Another Federal software development guideline and industry standard requirement is to use common data elements to ensure that software applications are capable of sharing information electronically without the need to reenter similar data. Only one of the five posts we reviewed used standard data elements as suggested in Federal guidance and by the software industry. The post succeeded in using a standard development approach for all of its application projects. This approach provided a consistent "look and feel" for all applications, controlled user access to data fields, and assured that changes made to the central databases were validated by unit supervisors. By adopting a well-defined development approach, this same post realized the efficiencies gained by using standard data elements in its local software and has reduced the need for developing additional applications. The software applications developed at the four other posts we visited could not demonstrate an adequate level of quality assurance or that security issues were consistently evaluated or implemented in the software.

Lastly, only a few of the 25 PC applications we observed had been adequately tested prior to implementation. Software testing is supposed to ensure that applications meet technical specifications and users requirements so that future maintenance resources will not be wasted. Without adequate software testing, users cannot be certain that the newly developed software will perform as requested. In one case, for example, users had to wait 20 seconds between each keystroke when inputting new data because the application was poorly designed and processed new information so slowly. The problem was not identified until after the application was installed on the LAN and in use throughout the embassy. The developer admitted the application could have worked better if he had thoroughly tested it on the embassy's computer system before

implementing it. As a result of this processing delay, users declined to use the application because it was inefficient, time-consuming, and did not improve their business processes, as they had anticipated.

Costs Not Tracked for Local Software Development

The Clinger-Cohen Act of 1996 requires Federal agencies to invest in information technology in a coordinated manner that clearly meets agency goals and supports mission objectives. To recognize the cost of technology investments and assure that these investments support agency goals, the Office of Management and Budget's Circular A-11 guides agencies to calculate and record the costs for software development projects. In addition, a 1995 GAO report[3] and OMB Circular A-130 *Management of Federal Information Resources,* issued in February 1996, also state that agencies should track and accumulate the costs associated with developing each software application. The intent of all of these legislative mandates is to ensure that Federal managers have accurate and timely information on technology investments.

Despite these cost-tracking requirements, none of the application development projects we reviewed overseas recorded the costs of these projects or could estimate the total expenditure. Nevertheless, senior post managers formally approved all of these projects and allocated staff time, software development tools, and PC equipment to complete the projects. Without exception, posts' technical staff said that they did not differentiate between the time used and the material spent in developing local software applications and other assigned work. We observed this condition even when technical staff were assigned to work exclusively on a specific development project that lasted for more than a year.

The lack of cost information for local software development projects results, in part, from inadequate oversight of software development activities by post managers responsible for allocating post expenditures and coordinating information management resources. In addition, posts have not been encouraged to account for or report the significant staff resources they expend in support of specific software development projects. To date, for instance, the ICASS system does not accumulate and redistribute the costs associated with posts' information management staff resources used to develop and maintain locally developed software. The Bureau of Finance and Management Policy also has not issued guidance for post managers on their responsibilities for accounting for and reporting IRM expenditures for software development projects.[4] Consequently, none of the administrative officers or information management officers at the posts we visited provided cost data on the software development projects sponsored at posts and we were unable to calculate the amount spent on either current or past software development projects.

[3] *Information Technology Investment, A Governmentwide Overview* (Report No. GAO/AIMD-95-308).
[4] *Software Maintenance at the Department of State* (6-IM-003).

Problems Managing Locally developed and Custom Software Acquisitions

Local software development projects were not well-managed at the locations we visited. The majority of software development projects took longer than post managers had expected and required additional staff and financial resources. Post managers often did not identify and control the technical resources needed to develop and implement local software applications, whether developed by embassy employees or acquired from commercial vendors. In some instances, despite known problems during development, post managers were compelled to continue the software projects to recoup the resources already devoted to them. For example, one post estimated that a specific software development project would take one technical staff member 3 months to complete. The project, however, became more complex than anticipated and required two technical staff more than 18 months of nearly full-time work, and was not fully implemented at the time of our visit.

One of the five posts we visited contracted with two local vendors; one contractor developed a new application and another customized a commercially available application. Generally, these efforts did not go well because contract requirements were not specific or well managed. In the first instance, although new financial reporting requirements had been identified by the post's financial management staff, the contractor was hired only to rewrite an existing, proprietary procurement application. Because the project was not adequately planned, the post did not provide the new requirements to the contractor. Consequently when it was completed, the application failed to meet the new financial reporting requirements and proved to be of limited use to the accounting staff. The application did not streamline the financial reporting process as had been expected. In addition, the development contract did not specify that documentation was required. When we asked the contractor if he would document the new software upon delivery, he said his contract did not require it and refused. He estimated that it would cost another $11,000 to document the application, which was the value of his current contract.

The second contractual effort that led to customizing a commercially available database application miscalculated the work required to implement the new system. The post negotiated for a local company to rewrite its commercial database application to support the requirements of the post's regional security officer's investigative case records. Even though the post had received and installed the customized application, it could not implement it fully or test it until the existing investigative data could be input manually. At the time of our visit, post management was having difficulty finding the staff to devote to this task and did not know when the application would be fully implemented. In the meantime, however, the limited warranty and technical support available in the purchase agreement was due to expire. Post officials expressed concern that by the time they fully implemented the application no technical support would be available and obtaining it later might be prohibitively expensive.

Post managers also reported that implementing commercial software that did not have to be customized can be problematic as well. One post, for instance, purchased a commercial software application that retails in the United States for under $500 and planned to use it to record diplomatic contacts. Access to this application was given to many users through the post's

LAN. Post management expected the application to create invitations and track representational activities. However, it did not meet the post's requirement because the number of contacts entered into it exceeded the application's capacity. As a result, with no advanced notice, the application failed and post staff spent many hours just prior to the post's large Independence Day event manually preparing invitations and tracking the contacts that were to be invited.

Inadequate management oversight of local software development can put posts' essential computer operations at risk. For example, the cognizant information management officers at two posts were unaware that locally developed software had been produced and loaded onto the embassies' central computer systems. Through our request for software inventories, two information management officers became aware that local developers had loaded and were using several software applications on their posts' main computer systems without receiving prior permission. Post employees had either developed and implemented the applications before the current information management officers arrived, or had more recently completed the applications and installed them without management approval.

Other problems concerning post software development demonstrate even greater need for strong management oversight and clear policies on local software development. On at least two occasions, embassy staff members have claimed legal ownership of the applications they developed. These technical staff have claimed that they developed the software after working hours or at their homes, and have either copyrighted the applications or demanded additional payment for allowing the posts to use them. Because post management had not exercised sufficient oversight of the development activities, local embassy officials have not been successful in discounting these employee claims. As a result, posts have not been able to obtain and make full use of the contested applications. Without full knowledge of the local software development projects ongoing at posts and operating on posts' computer systems, the Department cannot comply with the Clinger-Cohen Act of 1996, which requires it to effectively manage and evaluate information technology investments.

The problems we found associated with managing posts' locally developed software mirror those reported in a previous Department of State Inspector General review[5] and in a President's Council on Integrity and Efficiency report issued in September 1996.[6] The three major weaknesses reported in these reviews were (1) improper identification of costs, (2) inadequate management control over software changes and testing, and (3) poor contracting processes and performance monitoring. These problems appear consistently in Federal reviews dealing with software development and maintenance activities.

Federal Acquisition Regulations require that contracts over $2,500 be competitively awarded and include certifications to safeguard the interests of the Federal government. Through previous audit work and in conversations with officials of the Department's Office of the Procurement Executive, we found that obtaining and managing contracts for commercial software customization and development is prone to difficulties. These officials believe that post contracting officers should follow specific procurement guidance and obtain help when needed

[5] *Software Maintenance at the Department of State* (6-IM-003).
[6] Review *of Application Software Maintenance in Federal Agencies*, (PCIE, September 1996).

prior to committing Department funds for software development services. Recognizing the complexities of awarding software development contracts and the Department's preference for using commercially available software we conclude that new contracts for custom software development should be avoided whenever possible. In instances where a post determines it must pursue commercial software development or decides to contract for application customization services, it ought to follow rigorous standards consistent with Federal procurement regulations and best industry practices, which are the purview of the Office of the Procurement Executive.

Geographic Bureaus Inconsistently Address Posts' Software Needs

In addition to not establishing policies, issuing guidance, or mandating procedures for how posts develop and acquire local software applications, no State Department office or bureau has identified common software needs for posts worldwide. However, in the past 2 years, several geographic bureaus have begun to identify and respond to their constituent posts' software needs.

Geographic bureaus are pursuing a range of software development initiatives. While positive results may come of some of these efforts, there has been no Departmentwide coordination to ensure consistency. Bureau efforts to support locally developed software activities include attempting to inventory all locally developed applications, supporting a new Wide Area Network of posts to encourage collaboration in new application development, and funding a pilot program to develop new, common administrative software that may benefit many posts. At the same time, not all geographic bureaus support local development activities and the Department's central management has been silent on the topic. For example, the Bureau of Near Eastern Affairs and the Bureau of South Asian Affairs have discouraged local software development, and the Bureau of African Affairs has neither supported nor restricted local development.

In 1996, the Bureau of Inter-American Affairs attempted to inventory local applications Departmentwide. This effort did not yield a significant number of responses. Now, the bureau is considering a regional conference to facilitate standardizing local software applications that its posts could use.

The Bureau of East Asian and Pacific Affairs has obligated over $500,000 to support regional software development efforts. In early 1996, seven East Asian and Pacific Affairs posts agreed to share their locally developed software through a network called ChinaNet. The bureau purchased equipment to link those posts. ChinaNet is expected to facilitate developing and sharing software to meet posts' needs. A number of applications have been developed and are being tested at posts within the region.

In December 1996, the Bureau of European and Canadian Affairs held a conference that addressed locally developed software in the region. Several posts' information management officers and Foreign Service National staff demonstrated their locally developed applications. Attendees were enthusiastic about the software and the bureau's interest in sponsoring local development. After the conference, the bureau proposed a 2-year pilot project to demonstrate the feasibility of developing and disseminating locally developed applications to its posts. The pilot,

funded by the bureau, began in October 1997 and proposes to identify the best applications, ensure they meet Federal and Department software development standards, and distribute them.

USIA'S SOFTWARE DEVELOPMENT PRACTICES

Although USIS offices generally do not develop software, overseas staff commented on their concerns with corporate applications that have been developed or enhanced at headquarters or at a specifically selected USIS post. USIS staff said USIA does not encourage local software development and limits posts' flexibility in developing and enhancing corporate applications. Some USIS staff said that USIA has not always adequately determined overseas users' needs before developing corporate software. Others complained that corporate software does not appear to be tested adequately to ensure it will operate successfully on equipment that is placed overseas. Further, although USIA implemented an electronic bulletin board to facilitate sharing locally developed applications, it has not been used during the last 18 months or more. Staff assume it has not been used because local development is discouraged and staff are reluctant to submit their software, given USIA's restrictions.

Staffs' concerns with corporate applications centered around USIA's not identifying all users' needs and not thoroughly testing applications at overseas posts or in simulated environments before implementing software worldwide. These corporate applications included the Distribution Record System (DRS) that records and tracks diplomatic contacts and activities, the Budget Reporting Overseas Management System (BROMS), and the Country Plan application. Given that our objectives were to assess locally developed software, we did not verify posts' concerns about corporate applications. However, the following discussion of DRS indicates areas where additional focus may be needed.

Distribution Record System

According to one executive officer, USIS Germany was helping to develop a recent version of DRS but could not get the application to work correctly. At another post, a USIS official said that the DRS distributed to some posts is different from versions at other posts because not all versions have been similarly modified. At a third post, a USIS official said that the DRS application received from headquarters was not useful and the users' manual did not provide clear instructions. In addition, more than one post reported that technical support was necessary to install the DRS and that it would work on only one computer, even though several users needed access to it.

USIA has initiated changes to DRS many times since it first developed it about 17 years ago. Originally, the application operated on the Wang Corporation's Office Information Systems computer. It was converted to operate on Wang's Virtual System (mini) computer. Then it was rewritten to operate using two different database applications able to run on IBM-compatible personal computers. The newest version, under development in the Bureau of Management's Office of Technology, was being designed to operate in a Local Area Network (LAN) configuration. However, the Bureau planned to make no other enhancements to the previous DRS application.

When USIS Paris learned that the Office of Technology was developing a LAN-version of the DRS, USIS Paris officials notified Office of Technology officials that it was also developing a new version that would include enhancements. An Office of Technology official approved Paris' DRS development in place of USIA's headquarters' effort. The Paris USIS application has recently been completed with help from USIS Madrid, Bonn, and Rome. This application will soon be distributed to USIS offices worldwide. When the Paris DRS application is distributed, the Office of Technology plans to prevent tampering with and changing the application at posts. We also noted that this application has functions similar to those frequently developed locally in the Department's overseas posts' to aid in managing diplomatic contacts. The new DRS may be a system that will meet the need of State Department's overseas missions for a robust diplomatic contacts software application. Department posts might consider how DRS will meet their needs for this purpose before undertaking similar software development projects.

CONCLUSIONS

The Department has not issued specific guidance related to software development at overseas posts or directed that posts follow standard development practices. In addition, no policies now exist to direct posts as they purchase commercial software to meet their unique needs or contract to have commercial applications customized. Implementing locally developed applications overseas has been problematic for some posts because developers have not followed Federal guidance and post software development projects have not been well managed. Post managers have not tracked expenditures devoted to software development projects they have initiated on behalf of the post users and this lack of accountability means the Department cannot exercise adequate oversight of its information technology investments, as required in Federal legislation. USIA has approached software development differently from State, and its experience should be factored into any Department policies in this area.

RECOMMENDATIONS

Recommendation 1: We recommend that the chief information officer establish policies and provide guidance to domestic bureaus, offices, and overseas posts regarding the development, acquisition, and use of software applications, including commercially available software, to ensure that these activities conform to applicable Federal requirements, the Department's Information Resource Management Strategic and Performance Management Plans, and acquisition strategies.

The Office of Chief Information Officer concurred with this recommendation.

Recommendation 2: We recommend that the chief information officer, in coordination with the deputy chief information officer for Information Resource Management Operations and geographic bureaus' executive officers, (1) identify post software requirements that should be addressed by corporate applications, (2) designate the appropriate bureau or office to meet these requirements, and (3) develop a coherent strategy to guide this effort.

The Office of Chief Information Officer concurred with this recommendation. The Office of Information Management did not comment on this recommendation.

Recommendation 3: We recommend that the deputy chief information officer for Information Resource Management Operations provide a mechanism to register posts' locally developed software applications so that posts can share applications and reduce unnecessary duplication.

The Office of Information Management disagreed with this recommendation because IM believes that it places the life cycle responsibility for these applications on IM rather than with the corporate entity that owns the business process.

OIG did not intend that life cycle responsibility for these applications necessarily be placed on IRM. The intent of the recommendation is for the Department's Office of Information Resource Management to provide a vehicle accessible to all posts for post personnel to register and describe their locally developed applications. The vehicle chosen will allow managers from all other posts to review the data and evaluate whether the listed applications would meet their needs. One suggestion for the mechanism is to create a page on the Department's Internet Web site that lists applications developed at post that others can review

Recommendation 4: We recommend that the Bureau of Finance and Management Policy enforce the Federal requirement to track and report the Department's information technology investments, including applicable expenditures related to posts' local software development.

The Bureau of Finance and Management Policy concurred with this recommendation. However, it does not believe that Federal financial reporting requirements include the need to track software expenditures by individual post. OIG concurs with FMP's interpretation that reporting of expenditures by post is not required. However, the budget allocation system that FMP now has under development should provide a means for post management to accurately and consistently report local software development expenditures for inclusion in summary financial statements.

Recommendation 5: We recommend that the Office of the Procurement Executive, in coordination with the deputy chief information officer for Information Resource Management Operations, develop and implement a pre-award review mechanism for posts' contracting officers to use before contracting for local software development when total project costs are expected to exceed $2,500.

The Office of Information Management concurred with this recommendation. The Office of the Procurement Executive concurred with the recommendation only if the mechanism was in the form of a checklist to assist posts deal with software issues, and not a mandate to initiate a formal Department review and approval process for all actions exceeding $2,500. The OIG believes that issuing appropriate written guidance and developing and distributing a checklist to post contracting officers would allow posts to avoid the problems referenced in this report.

Recommendation 6: We recommend that the chief information officer, the deputy chief information officer for Information Resource Management Operations and the Bureau of European and Canadian Affairs assess lessons learned from the Bureau of European and Canadian Affairs' overseas software development pilot project and incorporate the results in the Department's strategy for addressing posts' software requirements.

The Office of Chief Information Officer, Office of Information Management, and Bureau of European and Canadian Affairs all concurred with this recommendation.

Locally Developed Software Applications at Five Overseas Posts

The following boxes contain the descriptive titles of locally developed software applications we observed and collected data on while reviewing development activities at five overseas posts.

* Denotes areas of duplication among posts' locally developed software.

Post A

LAN and PC Applications

1. Administrative Notices Database
2. Personnel System (Admin)
3. TelBook, TelBill, TelLine, TelData
4. Acquisitions Database*
5. Motorpool Operations*
6. Housing Assignment Database*
7. Security*
8. Maintenance Tracking (replaces REMS)
9. Parking Passes Tracking System

Wang VS Minicomputer Applications

10. Italian Personnel Benefits Program
11. Protocol System*
12. Ambassador Directory
13. Budget Application
14. Diplomatic Titles*
15. Exchange Rates
16. Commissary Identification Cards and Ration Cards
17. Password Change Program*
18. Representation System*
19. Local Guard Force*

Post B

LAN and PC Applications

1. Case Management System*
2. Warden Database
3. Identification Badge System*
4. Inventory System Program*
5. Motorpool Application*

Wang VS Minicomputer Applications

6. Regional Security Files*
7. Receiving Report*
8. Search NIV Data Base
9. Purchase Order Tracking*
10. NEPA Action List
11. American Citizen Services Label and Lost Passports
12. NEPA Work Orders
13. Accounts Receivable
14. India Fund (module for FMS)
15. Ambassador's Contacts*
16. Disposal/Auction System

Post C

LAN and PC Applications

1. Classified Pouch Software
2. Invitations and Contacts System*
3. Equipment Inventory System
4. Political Section Election Program
5. Health Benefit Program for FSNs

Wang VS Minicomputer Applications

6. Community Liaison Sponsor Program
7. Electricity Usage Tracking System
8. Narcotics Assistance Commodity Control
9. Communications Engineering Inventory Menu and Reports
10. Employee - Visa Referral System
11. Telephone Billing System
12. Local Vehicle Data System*
13. Identification Card System*
14. Federal Benefit Agency
15. INS-Refugee Tracking Application
16. Property Reports Application (local)*
17. Personnel Reports Program (local)*
18. Anti-Fraud Application
19. Local Hire Security System*

Post D

LAN and PC Applications

1. Procurement Application*
2. Trojakey - Document Management. (commercially contracted for)

Wang VS Minicomputer Applications

1. Inventory*
2. Utilities
3. Easybid
4. Easy Reports
5. Gasoline Tax
6. FMS Utilities*
7. ISC Utilities
8. Voucher Program

Post E

LAN and PC Applications

1. Travel Agency Visa Reference Program
2. HITEL (Download of Visa Information)
3. Protocol Database*
4. Administrative Database

Wang VS Minicomputer Applications

5. Gas and Decal Control
6. Fuel Receiving/Disposing Control
7. Weekly Visitors' Report